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January 7, 2002

## BOX PCT

Commissioner for Patents  
Washington, D.C. 20231

PCT/IE00/00084  
-filed July 5, 2000

Re: Application of **John Frederick FRITSCH** and **Roxanne Yvonne FRITSCH**

### A PROTECTIVE DEVICE

Our Ref: **Q67954**

Dear Sir:

The following documents and fees are submitted herewith in connection with the above application for the purpose of entering the National stage under 35 U.S.C. § 371 and in accordance with Chapter II of the Patent Cooperation Treaty:

- ☒ an English translation of the International Application.
- ☒ 3 sheets of drawings.
- ☒ a Form PTO-1449 listing the ISR references.
- ☒ a Preliminary Amendment
- ☒ a Written Opinion under PCT Rule 66

The Declaration and Power of Attorney will be submitted at a later date.

It is assumed that copies of the International Application, the International Search Report, the International Preliminary Examination Report, and any Articles 19 and 34 amendments as required by § 371(c) will be supplied directly by the International Bureau, but if further copies are needed, the undersigned can easily provide them upon request.

Applicant claims benefit of small entity status in accordance with 37 CFR § 1.27.

**Please see attached preliminary amendment before calculating Government filing fee.**

The Government filing fee is calculated as follows (**Small Entity fees apply**):

Total claims	<u>20</u>	-	20	=	<u>0</u>	x	\$9.00	=	<u>\$0.00</u>
Independent claims	<u>4</u>	-	3	=	<u>1</u>	x	\$42.00	=	<u>\$42.00</u>
Base Fee									<u>\$445.00</u>
<b>TOTAL FEE</b>									<u><b>\$487.00</b></u>



SUGHRUE MION, PLLC

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Entering National Stage of PCT/IE00/00084  
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A check for the statutory filing fee of \$487.00 is attached. You are also directed and authorized to charge or credit any difference or overpayment to Deposit Account No. 19-4880. The Commissioner is hereby authorized to charge any fees under 37 C.F.R. §§ 1.16, 1.17 and 1.492 which may be required during the entire pendency of the application to Deposit Account No. 19-4880. A duplicate copy of this transmittal letter is attached.

Priority is claimed from:

<u>Country</u>	<u>Application No</u>	<u>Filing Date</u>
IRELAND	S990560	July 6, 1999

Respectfully submitted,

Robert V. Sloan  
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Date: January 7, 2002

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**PATENT APPLICATION**  
**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

#4/a

In re application of

John Frederick FRITSCH, et al.

PCT/IE00/00084

Appln. No.: Not yet assigned

Attorney Docket Q67954

Confirmation No.: Not yet assigned

Group Art Unit: Not yet assigned

Filed: January 7, 2002

Examiner: Not yet assigned

For: A PROTECTIVE DEVICE

**PRELIMINARY AMENDMENT**

Commissioner for Patents  
Washington, D.C. 20231

Sir:

Prior to examination, please amend the above-identified application as follows:

**IN THE SPECIFICATION:**

**Please amend the specification as follows:**

Page 1, after the title insert the following statement and heading as follows:

--This is a National stage entry under 35 U.S.C. § 371 of Application No. PCT/IE00/00084

filed July 5, 2000; the disclosure of which is incorporated herein by reference.--

**BACKGROUND OF THE INVENTION**

Page 2, after the third full paragraph insert the heading

**SUMMARY OF THE INVENTION**

Page 9, after the first paragraph insert the heading

**BRIEF DESCRIPTION OF THE DRAWINGS**

Page 10, after the first paragraph insert the heading

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**DETAILED DESCRIPTION OF THE INVENTION**

**IN THE CLAIMS:**

**Please cancel claims 1-47 inclusive without prejudice or disclaimer.**

**Please add the following new claims:**

--48. A protective device for protecting an interface means (2,3) of the type hereinbefore defined of a read and/or write unit of the type hereinbefore defined, the read and/or write unit comprising a receiving area for receiving a data carrier, the interface means (2,3) being located in or adjacent the receiving area for interfacing with the data carrier for reading from and/or writing to the data carrier, characterized in that the protective device (1,20,30) comprises a carrier means (5) for engaging in the receiving area of the read and/or write unit, and a protecting means (6) carried on the carrier means (5) for engaging the interface means (2,3) for protecting the interface means (2,3) when the carrier means (5) is engaged in the receiving area.

49. A protective device as claimed in Claim 48 characterized in that the protecting means (6) is located on the carrier means (5) at a position which when the carrier means (5) is located in the receiving area coincides with an inoperative position of the interface means (2,3), and/or a position at which the interface means expects to find directory and/or other data on a data carrier.

50. A protective device as claimed in Claim 48 characterized in that the protecting means (6) engages the interface means (2,3) with a portion of the interface means (3,7) nested into the protecting means (6), and preferably, the area of the protecting means (6) offered up to the interface means (2,3) is at least of area similar to the area of the portion (3,7) of the interface

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means (2,3) to be nested into the protecting means (6), and advantageously, the area of the protecting means (6) offered up to the interface means (2,3) is greater than the area of the portion (3,7) of the interface means (2,3) to be nested into the protecting means (6), and ideally, the area of the protecting means (6) offered up to the interface means (2,3) is such that the protecting means (6) embraces a peripheral portion (7) extending around the portion (3) of the interface means (2,3) to be nested into the protecting means (6).

51. A protective device as claimed in claim 48 characterized in that the protecting means (6) is resilient, and preferably, the protecting means (6) comprises a plurality of fibres (15) extending from the carrier means (5) for engaging the interface means (2,3), and preferably, the fibres (15) of the protecting means (6) are flexible, and advantageously, the fibres (15) of the protective device (6) are resilient, and ideally, the fibres (15) of the protecting means (6) are provided in the form of a brush (6), and preferably, the fibres (15) of the protecting means (6) extend from a base member (14) mounted on the carrier means (5), and advantageously, a resilient mounting means (21) is provided for resiliently mounting the base member (14) of the protecting means (6) to the carrier means (5).

52. A protective device as claimed in claim 52 characterized in that the carrier means (5) defines a central axis (9) for in use coinciding with a rotational axis of a data carrier in the receiving area, and preferably, the carrier means (5) defines a carrier plane, and the fibres (15) of the protecting means (6) extend from the carrier means (5) at an angle to the carrier plane of less than 90°, and preferably, the fibres (15) of the protecting means (6) extend from the carrier means (5) at an angle to the carrier plane in the range of 20° to 80°. and advantageously, the

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fibres (15) of the protecting means (6) extend from the carrier means (5) at an angle to the carrier plane in the range of 50° to 80°, and advantageously, the fibres (15) of the protecting means (6) extend from the carrier means (5) in a direction circumferentially relative to the central axis (9) defined by the carrier means (5).

53. A protective device as claimed in any of Claim 5 characterized in that the protecting means (6) extends circumferentially around the central axis (9) defined by the carrier means (5), and preferably, the protecting means (6) extends completely around the central axis (9) defined by the carrier means (5).

54. A protective device as claimed in Claim 52 characterized in that the protecting means (6) is spaced apart from the central axis (9) defined by the carrier means (5).

55. A protective device as claimed claim 48 characterized in that the protecting means (6) protects the interface means (2,3) from dirt and dust, and preferably, the protecting means (6) protects the interface means (2,3) from shock.

56. A protective device as claimed in claim 48 characterized in that an indicating means (12) is provided for indicating the direction in which the carrier means (5) is to be inserted in the receiving area of the read and/or write unit, and preferably, the indicating means (12) is provided on the carrier means (5), and preferably, the indicating means (12) facilitates alignment of the protecting means (6) with the interface means (2,3).

57. A protective device as claimed in claim 48 characterized in that the protecting means (6) is located on the carrier means (5) for cleaning the interface means (2,3) as the carrier means (5) is being inserted in the receiving area, and preferably, the protecting means (6) is

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located on the carrier means (5) for cleaning the interface means (2,3) when the read/write unit is activated for reading or writing data, and the interface means (2,3) is being initially moved for identifying data.

58. A protective device as claimed in claim 48 characterized in that the carrier means (5) is provided for engaging in a disc receiving area of a disc drive read and/or write unit, and the protecting means (6) is provided for protecting a read and/or write head forming the interface means (23) of the read and/or write unit, and preferably, the protecting means (6) cleans the read and/or write head (2,3) of the disc drive read and/or write unit as the read and/or write head (2,3) is being initially moved for identifying data, and advantageously, the protecting means (6) cleans the read and/or write head of the disc drive read and/or write unit as the read and/or write head is being moved substantially perpendicularly relative to the carrier means (5) into and out of the protecting means (6).

59. A protective device as claimed in Claim 58 characterized in that the protecting means (6) is for protecting a read and/or write head provided by an optical head (2,3), and preferably, the protecting means (6) is for engaging a lens (3) of the read and/or write optical head (2), and advantageously, the protecting means (6) is for protecting a read and/or write head provided by a magnetic head (2,3).

60. A method for protecting an interface means (2,3) of the type hereinbefore defined of a read and/or write unit of the type hereinbefore defined in which the read and/or write unit comprises a receiving area for receiving a data carrier, and the interface means (2,3) is located in or adjacent the receiving area, the method comprising the steps of inserting a carrier means (5)

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having a protecting means (6) mounted thereon into the receiving area of the read and/or write unit, and engaging the protecting means (6) with the interface means (2,3) when the carrier means (5) is engaged in the receiving area for protecting the interface means (2,3).

61. A method as claimed in Claim 60 characterized in that the protecting means (6) protects the interface means (2,3) from dirt and/or dust.

62. A method as claimed in Claim 60 characterized in that the protecting means (6) protects the interface means (2,3) from shock.

63. A method as claimed in Claim 60 characterized in that the protecting means (6) cleans the interface means (2,3) as the carrier means (5) is being inserted into the receiving area, and preferably, the protecting means (6) cleans the interface means (2,3) when the interface means (2,3) has been activated to identify data, and advantageously, the protecting means (6) cleans the interface means (2,3) when the interface means (2,3) is being initially moved perpendicularly relative to the carrier means (5) into and out of the protecting means (6) for identifying data.

64. A method for protecting an interface means (2,3) of the type hereinbefore defined of a read and/or write unit of the type hereinbefore defined in which the read and/or write unit comprises a receiving area for receiving a data carrier, and an interface means (2,3) is located in or adjacent the receiving area, the method comprising the steps of inserting the carrier means (5) of the protective device (1,20,30) as claimed in any of Claims 1 to 34 into the receiving area of the read and/or write unit, and engaging the protecting means (6) with the interface means (2,3)



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when the carrier means (5) is inserted in the receiving area for protecting the interface means (2,3).

65. A method as claimed in Claim 64 characterized in that the read and/or write unit is a disc drive read and/or write unit, and the interface means (2,3) is a read and/or write head, and preferably, the read and/or write head (2,3) is an optical head (2), and alternatively, the read and/or write head (2,3) is a magnetic head, and preferably, the method further comprises activating the read and/or write unit for causing the interface means (2,3) to cycle perpendicularly relative to a plane defined by the carrier means (5) for cycling the interface means into and out of the protecting means (6) for cleaning the interface means (2,3).

66. A cleaning device for protecting an interface means (2,3) of the type hereinbefore defined of a read and/or write unit of the type hereinbefore defined, the read and/or write unit comprising a receiving area for receiving a data carrier, the interface means (2,3) being located in or adjacent the receiving area for interfacing with the data carrier for reading from and/or writing to the data carrier, characterised in that the cleaning device (1,20,30) comprises a carrier means (5) for engaging in the receiving area of the read and/or write unit, and a cleaning means (6) carried on the carrier means (5) for alignment with the interface means (2,3) when the carrier means (5) is located in the receiving area so that movement of the interface means (2,3) when the read and/or write unit is activated for identifying data the interface means (2,3) is moved into and out of the cleaning means (6) for cleaning the interface means (2,3).

67. A method for cleaning an interface means (2,3) of the type hereinbefore defined of a read and/or write unit of the type hereinbefore defined in which the read and/or write unit

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comprises a receiving area for receiving a data carrier, and the interface means (2,3) is located in or adjacent the receiving area, the method comprising the steps of inserting a carrier means (5) having a cleaning means (6) mounted thereon into the receiving area of the read and/or write unit with the cleaning means (6) aligned with the interface means (2,3) when the carrier means (5) is engaged in the receiving area, and activating the read and/or write unit for causing the interface means (2,3) to move relative into and out of the cleaning means (6) for identifying data for cleaning the interface means (2,3).--

**IN THE ABSTRACT:**

**Please delete the title after the heading “ABSTRACT” and delete the improper second paragraph of the Abstract containing the parenthetical phrase “(Figs. 1 and 3 to accompany the abstract)”.**

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**REMARKS**

The application has been amended to delete the multiple dependencies therein, to provide appropriate headings for the various sections of the specification, and to delete the erroneous improper second paragraph of the abstract. Entry and consideration of this Amendment and an early and favorable action on the merits is respectfully requested.

Respectfully submitted,



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Date: January 7, 2002

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**APPENDIX**

**VERSION WITH MARKINGS TO SHOW CHANGES MADE**

**IN THE SPECIFICATION:**

Amend the specification as follows:

Page 1, after the title insert the following statement and heading as follows:

--This is a National stage entry under 35 U.S.C. § 371 of Application No. PCT/IE00/00084  
filed July 5, 2000; the disclosure of which is incorporated herein by reference.--

**BACKGROUND OF THE INVENTION**

Page 2, after the third full paragraph insert the heading

**SUMMARY OF THE INVENTION**

Page 9, after the first paragraph insert the heading

**BRIEF DESCRIPTION OF THE DRAWINGS**

Page 10, after the first paragraph insert the heading

**DETAILED DESCRIPTION OF THE INVENTION**

**IN THE CLAIMS:**

Claims 1-47 inclusive are canceled.

Claims 48-67 are added as new claims.

**IN THE ABSTRACT OF DISCLOSURE:**

Delete the title after the heading "ABSTRACT" and delete the improper second  
paragraph of the Abstract containing the parenthetical phrase "(Figs. 1 and 3 to  
accompany the abstract)".

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"A protective device"

The present invention relates to a protective device, and in particular, to a protective device for protecting an interface means, for example, a read and/or write head or a pin connector of a read and/or write unit of the type in which the interface means is provided for reading and/or writing data to or from a data carrier, such as, for example, a floppy disc, an optical disc, a data cartridge unit or an integrated circuit chip of the type which, for example, stores computer games and the like.

10 In this specification the term read and/or write unit is used to include at least the following within its meaning, an optical disc drive unit, for example, a music compact disc player and/or recorder unit, a CD ROM read and/or write drive unit, a floppy disc drive, a tape drive unit, for example, a magnetic tape drive unit, such as, a tape cassette player and/or recorder unit, or a tape cassette read and/or write unit, a data cartridge tape drive unit, and a read and/or write unit of the type adapted to read and/or write, but in particular to read an integrated chip in which a computer game is stored. The term interface means is used in this specification to mean any type of interface which interfaces with a data carrier in a read and/or write unit for reading from and/or writing to the data carrier. Such interface means would at least include a read and/or write head, which may be a magnetic head or an optical head, or a combination of both. Such interface means would also include a pin and/or socket connector for connecting to a corresponding pin and/or socket connector of an integrated circuit chip of the type on which a computer game is stored. Such read and/or write units typically are provided with a receiving area for receiving the data carrier which may be, for example, a floppy disc, an optical disc, a tape cassette or a data carrier tape cassette, or an integrated circuit chip housed in a housing with a pin and/or socket connector. The interface means, typically is located in or adjacent the receiving area for interfacing with the data carrier for in turn reading and/or writing data to or from the data carrier. Such read and/or write units may be suitable for receiving data carriers on which the data is stored in digital and/or analogue form and may be for music and/or computer data, or otherwise.

Such read and/or write units are well known. As discussed above, the interface

means, typically, a read and/or write head or a pin and/or socket connector are located in or adjacent the receiving area for receiving the data carrier. In general, the read and/or write head of such units, or pin and/or socket connector are relatively fragile components and are easily damaged by, for example, shock and the like.

5 Additionally, if the interface means of such read and/or write units become soiled with dust or dirt, in general they become inoperable. Because of the construction of many such read and/or write units, dust and dirt can readily easily collect on the interface means, and in particular, can collect on the interface means when the read and/or write unit is not in use.

10

While cleaning devices are known for cleaning read and/or write heads of such units when the read and/or write units are operational, there are no protective devices which satisfactorily protect the read and/or write head when the read and/or write unit is not in use. In particular, there are no protective devices which satisfactorily  
15 protect the read and/or write head from dust and/or dirt when the read and/or write unit is not in use.

20

There is therefore a need for a protective device which protects an interface means of the type hereinbefore defined of a read and/or write unit of the type hereinbefore defined from dirt and dust when the read and/or write unit is not in use. It is also desirable, that the protective device should protect the interface means from shock when the read and/or write unit is not in use.

25

The present invention is directed towards providing such a protective device.

30

According to the invention there is provided a protective device for protecting an interface means of the type hereinbefore defined of a read and/or write unit of the type hereinbefore defined, the read and/or write unit comprising a receiving area for receiving a data carrier, the interface means being located in or adjacent the  
30 receiving area for interfacing with the data carrier for reading from and/or writing to the data carrier, wherein the protective device comprises a carrier means for engaging in the receiving area of the read and/or write unit, and a protecting means carried on the carrier means for engaging the interface means for protecting the

interface means when the carrier means is engaged in the receiving area.

In one embodiment of the invention the protecting means is located on the carrier means at a position which when the carrier means is located in the receiving area coincides with an inoperative position of the interface means, and/or a position at  
5 which the interface means expects to find directory or other relevant data on a data carrier.

Preferably, the protecting means engages the interface means with a portion of the  
10 interface means nested into the protecting means. Advantageously, the area of the protecting means offered up to the interface means is at least of area similar to the area of the portion of the interface means to be nested into the protecting means. Ideally, the area of the protecting means offered up to the interface means is greater than the area of the portion of the interface means to be nested into the protecting  
15 means. Preferably, the area of the protecting means offered up to the interface means is such that the protecting means embraces a peripheral portion extending around the portion of the interface means to be nested into the protecting means.

In one embodiment of the invention the protecting means is resilient.  
20

In another embodiment of the invention the protecting means comprises a plurality of fibres extending from the carrier means for engaging the interface means. Preferably, the fibres of the protecting means are flexible. Advantageously, the fibres of the protective device are resilient. Ideally, the fibres of the protecting means are  
25 provided in the form of a brush. Advantageously, the fibres of the protecting means extend from a base member mounted on the carrier means.

In one embodiment of the invention a resilient mounting means is provided for resiliently mounting the base member of the protecting means to the carrier means.  
30

In another embodiment of the invention the carrier means defines a central axis for in use coinciding with a rotational axis of a data carrier in the receiving area.





In one embodiment of the invention the protecting means is located on the carrier means for cleaning the interface means when the read/write unit is activated for reading or writing data, and the interface means is being initially moved for  
5 identifying data.

In another embodiment of the invention the carrier means is provided for engaging in a disc receiving area of a disc drive read and/or write unit, and the protecting means is provided for protecting a read and/or write head forming the interface means of the  
10 read and/or write unit.

In a further embodiment of the invention the protecting means cleans the read and/or write head of the disc drive read and/or write unit as the read and/or write head is being initially moved for identifying data.  
15

In a still further embodiment of the invention the protecting means cleans the read and/or write head of the disc drive read and/or write unit as the read and/or write head is being moved substantially perpendicularly relative to the carrier means into and out of the protecting means.  
20

In a further embodiment of the invention the protecting means is for protecting a read and/or write head provided by an optical head.

In one embodiment of the invention the protecting means is for engaging a lens of  
25 the read and/or write optical head. Alternatively, the protecting means is for protecting a read and/or write head provided by a magnetic head.

Additionally, the invention provides a method for protecting an interface means of the type hereinbefore defined of a read and/or write unit of the type hereinbefore defined  
30 in which the read and/or write unit comprises a receiving area for receiving a data carrier, and the interface means is located in or adjacent the receiving area, the method comprising the steps of inserting a carrier means having a protecting means mounted thereon into the receiving area of the read and/or write unit, and engaging





device is located in the receiving area of the read and/or write unit. Additionally, where the protective device is adapted for protecting the interface means against shock, while the protective device is located in the receiving area of the read and/or write unit the interface means is protected by the protecting means against shock. A  
 5 further advantage of the invention is achieved when the protecting means is provided with a cleaning action, in that the protective device as well as protecting the interface means against shock and/or dirt and dust also tends to clean the portion of the interface means engaged by the protecting means.

10 The provision of the protecting means in the form of a brush provides a particularly desirable form of the protective device in that as well as protecting against dirt and dust, the protective device also acts to clean the interface means as the protecting means is passed relative to the interface means on being inserted into or ejected from the receiving area of the read and/or write unit. Indeed, by providing the brush  
 15 of the protecting means with sufficient resilience the protective device has the further advantage of protecting the interface means against shock.

A further advantage of the invention is that it is particularly suitable for cleaning the head, and in particular, an optical head of a disc drive unit where the optical head is  
 20 particularly dirty. By virtue of the fact that the only relative movement required between the head and the protecting means when the disc drive unit is activated is the movement of the head during its focusing cycles, the disc drive unit may be operated a sufficient number of times until the head has been cleaned. This is a particularly important advantage over and above those cleaning devices in which  
 25 relative lateral movement, namely, relative radial and circumferential movement between the head and a cleaning means on a carrier means is required, since in many disc drive units the head of the disc drive unit will not move radially from its inactive position until data has been found on the inner data track of a CD ROM or music CD disc, or the like. Additionally, in some disc drive units the CD ROM or  
 30 music CD will not commence to rotate in the event that the lens of the optical head is so dirty as to prevent any reading of data whatsoever. Essentially the device according to the invention acts as a stationary cleaning device, in other words the device cleans the interface means without movement of the device being required.

For example, when the device is adapted for protecting and/or cleaning an optical head of a disc drive unit rotation of the carrier means is not required. Cycling movement of the optical head for focusing the head is sufficient for obtaining cleaning of the optical head and/or the lens of the optical head.

5

The invention will be more clearly understood from the following description of some preferred embodiments thereof which are given by way of example only with reference to the accompanying drawings, in which:

10        Fig. 1 is a perspective view of a protective device according to the invention for protecting an interface means, namely, a read and/or write head of a read and/or write unit, namely, a disc drive unit,

15        Fig. 2 is an enlarged perspective view of a portion of the protective device of Fig. 1,

Fig. 3 is a transverse cross-sectional side elevational view of a portion of the protective device of Fig. 1 on the line III-III of Fig. 1 illustrated in use,

20        Fig. 4 is a perspective view of a protective device according to another embodiment of the invention for protecting a read write head of a read write unit,

25        Fig. 5 is an enlarged perspective view of a portion of the protective device of Fig. 4,

Fig. 6 is a transverse cross-sectional side elevational view of a portion of the protective device of Fig. 4 on the line VI-VI of Fig. 4 illustrated in use,

30        Fig. 7 is a perspective view of a protective device according to a further embodiment of the invention for protecting a read/write head of a read and/or write unit, and

Fig. 8 is a transverse cross-sectional side elevational view of a portion of the protective device of Fig. 7 on the line VIII-VIII of Fig. 7 illustrated in use.

Referring to the drawings and initially to Figs. 1 to 3, there is illustrated a protective  
5 device according to the invention indicated generally by the reference numeral 1 for  
protecting an interface means, in this embodiment of the invention a read and/or  
write optical head 2 of a read and/or write unit, namely, a music CD disc drive unit  
(not shown) such as a music compact disc player and/or recorder unit. The  
protective device 1 protects a lens 3 in a lens carrier 4 of the head 2 from dust and  
10 dirt, and also protects the head 2 from shock when the disc drive unit is not in use.  
Only the lens 3 and a portion of the lens carrier 4 of the head 2 are illustrated  
schematically in Fig. 3. The protective device 1 also acts as a cleaning device for  
cleaning the lens 3 of the read and/or write head 2 as will be described below. The  
protective device 1 comprises a carrier means, namely, a carrier disc 5 which is  
15 similar in size and shape to a music CD disc for engaging in a disc receiving area  
(not shown) of the disc drive unit. A protecting means for protecting the read and/or  
write head 2 comprises a brush member 6 for engaging the lens 3 of the read and/or  
write head 2 as well as a peripheral portion 7 of the lens carrier 4, which extends  
around the lens 3 adjacent the lens 3 for protecting the lens 3 against dust and dirt,  
20 and for protecting the head 2 against shock. The brush member 6 is carried on and  
secured to the carrier disc 5 by any suitable securing means, in this case, an  
adhesive.

The carrier disc 5 is provided with a central opening 8, similar to the central opening  
25 of a music CD disc, and defines a central axis 9 which when the carrier disc 5 is  
inserted in the disc receiving area of the disc drive unit coincides with the rotational  
axis of a music CD disc when similarly inserted in the disc drive unit. The brush  
member 6 is located at a position radially spaced apart from the central axis 9 of the  
carrier disc 5 which coincides with the inner data track of a music CD disc so that  
30 when inserted in the disc receiving area of the disc drive unit the brush member 6  
lies on substantially the same radius as the head 2 when the head 2 of the disc drive  
unit is in the inactive position. The normal inactive position of an optical head of disc  
drive unit is aligned with the position of the inner data track of a music CD disc. The

normal location of the inner data track of a music CD disc is indicated on the carrier disc 5 in Fig. 1 by the broken lines 10. A broken line 11 indicates the outer periphery of the area in which data is written on a music CD disc.

- 5 An indicating means provided by an arrow head 12 is printed or otherwise formed on the carrier disc 5 for indicating the direction in which the carrier disc 5 should be entered in the disc drive unit and how the carrier disc should be aligned with the disc receiving area, so that when the carrier disc 5 is fully inserted in the receiving area of the disc drive unit the brush member 6 is substantially centrally aligned with the head
- 10 2. In this embodiment of the invention the arrow head 12 is located for alignment with a head accommodating slot in a CD disc receiving tray for receiving and carrying the CD disc into the disc receiving area of the disc drive unit. Such disc receiving trays of disc drive units will be well known to those skilled in the art.
- 15 The brush member 6 comprises a base member 14, which in this embodiment of the invention is provided by woven sheet material, into which fibres 15 of the brush member 6 are woven and extend therefrom at an angle  $\alpha$  of approximately  $80^\circ$  to the carrier disc 5. The fibres 15 in extending from the carrier member 5 at the angle  $\alpha$  of  $80^\circ$  extend in a direction generally circumferentially relative to the central axis 9 for
- 20 causing the fibres 15 to engage the lens 3 with a wiping, scouring action as the brush member 6 passes the lens 3 as the carrier disc 5 is being engaged in the disc receiving area of the disc drive unit for cleaning the lens 3. The fibres 15 are flexible, but are also resilient for resiliently engaging the lens 3 and the peripheral portion 7 of the lens carrier 4 of the head 2. The base member 14, and in turn the brush member
- 25 6 when viewed in plan are of rectangular shape, in this embodiment of the invention 20mm by 10mm. The base member 14 is secured to the carrier disc 5 with the longer dimension, namely, the 20mm sides extending circumferentially relative to the central axis 9 of the carrier disc 5, and the short dimension, namely, the 10mm sides extending radially relative to the central axis 9 of the carrier disc 5. In general, the
- 30 diameter of a lens of a read and/or write optical head 2 is in the order of 5mm to 6mm diameter, and accordingly, the area of the brush member 6 when viewed in plan is considerably greater than the area of the lens 3, similarly, when viewed in plan. The fact that the area of the brush member 6 in plan view is significantly

The length of the fibres 15 depends on the type of disc drive unit, and the read and/or write head of which is to be protected. However, ideally, the length of the fibres 11 should be such as to allow at least 0.5 to 2mm of projection of the fibres beyond the lens 3, to ensure that the lens 3 and the peripheral portion 7 of the head 2 adjacent the lens 3 are properly nested into the brush member 6.



In use, the protective device 1 is placed on the disc receiving tray of the disc drive unit with the arrow head 12 aligned with the head accommodating slot in the disc receiving tray. The disc drive unit is then activated for drawing the disc receiving tray, and in turn the device 1 into the disc receiving area of the disc drive unit. On the carrier disc 5 being fully drawn into the disc receiving area the brush member 6 is aligned with the head 2 of the disc drive unit when the head 2 is in the inactive position. As the carrier disc 5 is approaching its fully inserted position into the disc receiving area the brush member 6 wipes across the lens 3 of the head 2, and also the brush member 6 wipes the peripheral portion 7 of the lens carrier 4, thereby causing a cleaning action for cleaning the lens 3 and the peripheral portion 7 of the lens carrier 4. When the carrier disc 5 is fully inserted in the disc receiving area, the head 2 in its inactive position engages and nests within the brush member 6 so that the lens 3 and the peripheral portion 7 of the lens carrier 4 are embraced by the fibres 15 of the brush member 6 for protecting the lens 3 and the peripheral portion 7 of the lens carrier 4 against dirt and dust, and also for protecting the head 2 against shock.

A further cleaning action may be achieved by operating the disc drive unit when the carrier disc 5 is inserted in the disc receiving area and the brush member 6 is aligned with the head 2. On activation of disc drive unit the head 2 commences to cycle upwardly and downwardly in the directions of the arrows A and B perpendicularly relative to a plane defined by the carrier disc 5, and this upward and downward cycling movement of the head 2 causes the lens 3 and the peripheral portion 7 of the lens carrier 4 to be urged repeatedly inwardly into and outwardly from the brush member 6. This in and out cycling movement of the head 2 into and out of the brush member 6 causes the fibres 15 to wipe the lens 3 and the peripheral portion 7 of the lens carrier 4, thereby further cleaning the lens 3 and the peripheral portion 7 of the lens carrier 4. This inward and outward cycling movement of the head 2 is undertaken by the disc drive unit when the disc drive unit is powered up for causing the head 2 to focus on the data on the inner data track. By virtue of the fact that the brush member 6 is in engagement with the head 2 the head 2 fails to identify data and continues to cycle inwardly and outwardly of the brush member 6 a number

of times in an attempt to focus on data. However, after a number of repeated inward and outward cycles of the head 2 into and out of the brush member 6 the disc drive unit shuts down. This part of the operation of a disc drive unit will be well known to those skilled in the art.

5

Typically, the cycling of the head 2 into and out of the brush member 6 for focusing the head 2 continues for a number of focusing cycles. The number of focusing cycles depends on the particular type of disc drive unit. However, in general, the read and/or write head of a music CD disc drive unit would cycle into and out of the cleaning brush for at least four cycles, and in many cases more than four cycles. In general, four focusing cycles of the head 2 into and out of the brush member 6 is sufficient for cleaning a moderately dusty lens. However, if the lens is heavily soiled, the disc drive may be activated a number of times so that each time the disc drive unit is activated the lens will cycle for the appropriate number of focusing cycles into and out of the brush member 6.

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Additionally, in certain cases if desired a cleaning fluid which preferably, is a relatively volatile fluid may be applied to brush member 6 for further enhancing the cleaning action of the brush member 6.

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Typically, when the disc drive unit is not in use the protective device 1 is inserted into the disc receiving area for protecting the head of the disc drive unit. When it is desired to use the disc drive unit, the disc drive unit is operated for ejecting the protective device 1. However, in general, it is desirable that the disc drive unit should be activated when the protective device 1 is inserted for cleaning the lens, and may also be activated prior to ejection of the protective device 1 for also cleaning the head.

25

Referring now to Figs. 4 to 6 there is illustrated a protective device according to another embodiment of the invention indicated generally by the reference numeral 20 also for protecting a lens 3 and a read and/or write head 2 of a music CD disc drive unit. The protective device 20 is substantially similar to the protective device 1 and similar components are identified by the same reference numerals. The main

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difference between the protective device 20 and the protective device 1 is that instead of the brush member 6 being mounted directly onto the carrier disc 5, the brush member 6 is carried on a resilient mounting means, namely, a resilient carrier arm 21 of plastics material which is secured to the carrier disc 5 by adhesive. The carrier arm 21 is secured to a rear surface 22 of the carrier disc 5, and an circular opening 23 is provided in the carrier disc 5 for accommodating the fibres 15 of the brush member 6 therethrough. Additionally, in this embodiment of the invention the brush member 6 instead of being of rectangular shape in plan view is of circular shape. The provision of the carrier arm 21 of a resilient material, further enhances the resilient action of the brush member 6 on the head 2 for enhancing protection of the head 2 against shock.

Otherwise, the protective device 20 is similar to the protective device 1 and its use is likewise similar.

Referring now to Figs. 7 and 8 there is illustrated a protective device according to a further embodiment of the invention indicated generally by the reference numeral 30 also for protecting a lens 3 and a read and/or write head 2 of a read and/or write music CD disc drive unit. The protective device 30 is substantially similar to the protective device 1 and similar components are identified by the same reference numerals. The main difference between the protective device 30 and the protective device 1 is that the brush member 6 instead of being provided in a rectangular or circular shape is provided in the form of an annular ring 31 which extends circumferentially around and concentrically with the central axis 9 of the carrier disc 5, and coincides with the inner data track of a music CD disc. The advantage of providing the brush member 6 to extend in the form of the annular ring 31 avoids any danger of misalignment of the brush member with the head 2.

In this embodiment of the invention the fibres 15 extend from the base member 14 at an angle  $\alpha$  of approximately  $80^\circ$  in a general direction circumferentially relative to the central axis 9 in similar fashion as the fibres 15 extend from the base member 14 of the brush 6 of the protective device 1.

Otherwise, the protective disc 30 is similar to the protective disc 1, and its operation is likewise similar.

While the protective devices have been described for protecting the read and/or  
5 write head against both shock and dust and dirt, it is envisaged that in certain cases the protective devices may be provided for protecting against one or the other, in other words, for protecting the head against either shock or dust and dirt. Additionally, while the protective device according to the invention has been described as also having a cleaning action, while this is preferable, it is not essential.

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While the brush members have been described as being surface mounted directly onto the carrier disc of the protective devices 1 and 30 of Figs. 1 to 3 and 7 and 8, it is envisaged that the base members of the brush members may be recess mounted into recesses in the carrier disc. Additionally, it is envisaged that the brush members  
15 may be mounted onto the carrier disc on resilient blocks.

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While it is desirable, it will be appreciated that it is not essential that the carrier means should be similar in shape and size to a data carrier of the type used with the read and/or write unit, the carrier means may be of any desired or suitable shape. Additionally, it will be appreciated that the central opening in the carrier means may be of any desired or suitable size, and need not necessarily be of size similar to that of a central opening of a data carrier of the type used with the read and/or write unit. Indeed, in certain cases it may be desirable that the central opening should be of diameter greater than that of a normal central opening of the appropriate data  
25 carrier. Indeed, in the case of a DVD read and/or write unit in order to avoid the carrier disc rotating, it may be desirable to provide the central opening in the carrier disc of diameter greater than the diameter of a central opening of a DVD for avoiding engagement of the DVD drive with the carrier disc.

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Needless to say, it is envisaged that in certain cases, the protective device may be required for protecting an optical head of a disc drive unit in which the optical head is provided with more than one lens, for example, a pair of adjacent lenses, in such cases, it will be appreciated that the area of the protecting means will be such as to

cover the part of the head which is to be protected and to cover the two or more lenses.

While the protective device according to the invention has been described for  
 5 protecting a read/write head of a music CD disc drive unit from shock, dust and dirt,  
 and also for cleaning the read and/or write head of a music CD disc drive unit, it is  
 envisaged that the protective device may be used for protecting and/or cleaning the  
 head or indeed any other interface means for interfacing with a data carrier of any  
 other read and/or write unit. For example, the protective device may be used for  
 10 protecting and/or cleaning the read and/or write head of any of the following read  
 and/or write units, CD ROM read and/or write units, digital video disc (DVD) player  
 and/or recorder units, CD interactive drive units, Zip drive units, Jazz drive units,  
 super disc drive units, floppy disc drive units, mini disc drive units, digital  
 camcorders, digital cameras, audio tape drive units, data cartridge drive units, and  
 15 any other read and/or write units. Where the protective device is adapted for  
 protecting and/or cleaning the interface means of any of these read and/or write  
 units, preferably an appropriate sized and shaped carrier mean will be provided for  
 engaging in the data carrier receiving area of the read and/or write unit. Needless to  
 say, the brush member will also be appropriately sized, shaped and located for  
 20 engaging the portion of the interface means to be protected and nested into the  
 brush member.

The protective device according to the invention may also be adapted for protecting  
 a multi pin plug or socket connector in a data carrier receiving area of a read write  
 25 unit of the type for receiving a data carrier cassette in which the data is stored on an  
 integrated chip. In which case it is preferable that the carrier means would be of a  
 shape and size corresponding to the data carrier cassette and the protecting means  
 would be mounted on the carrier means at an appropriate location for engaging the  
 multi pin connector.

30 It will of course be appreciated that any other suitable protecting means may be  
 provided besides a brush member for protecting the read/write head and/or other  
 interface means from shock, dust and dirt. An advantage of providing the protecting

means by way of a brush member is that the protective device as well as acting as a protective device also acts as a cleaning device for cleaning the lens and/or any other component of the interface means of the read and/or write unit. However, where it is desired to provide the protective device as a protective device for

5 protecting the interface means against dirt and dust only, the resilience of the fibres of the brush member, or its resilient mounting is not as important as when it is desired that the protective device should protect the interface means against shock. The more shock protection which is required, the more resilient should be the fibres of the brush member, and/or the more resilient should be the mounting of the brush

10 member on the carrier disc. Additionally, where it is desired to provide the protective device as a protective device against shock only, the size and area of the protecting means and in particular, its area relative to the interface means is not particularly critical, provided that its shape and area are sufficient for engaging the interface means for protecting against shock. However, where the protective device is to

15 protect against dust and dirt, it is important that the area of the protecting means offered up to the interface means should be such as to at least cover the area of the interface means to be protected against dust and dirt.

While the fibres of the brush member have been described as comprising a plurality

20 of texturised filaments, it is envisaged that the fibres may be formed in other ways and when formed by filaments, it is not essential that the filaments be texturised.

While the indicating means has been described as being provided by an arrow head, any other suitable indicating means for indicating how the device is to be entered in

25 the disc receiving area may be provided in disc drive units where a CD disc is entered manually into a slot and is then subsequently drawn through the slot by the disc drive unit into the disc receiving area, it is envisaged that the indicating means may be provided by an arrow head, which would indicate the portion of the carrier disc to be initially entered in the slot, and the orientation of the disc relative to the

30 slot. Additionally, in some disc drive units a specific indicating means may not be required due to the fact that the shape of the carrier means may facilitate self-alignment.

### Claims

1. A protective device for protecting an interface means (2,3) of the type hereinbefore defined of a read and/or write unit of the type hereinbefore defined, the read and/or write unit comprising a receiving area for receiving a data carrier, the interface means (2,3) being located in or adjacent the receiving area for interfacing with the data carrier for reading from and/or writing to the data carrier, characterised in that the protective device (1,20,30) comprises a carrier means (5) for engaging in the receiving area of the read and/or write unit, and a protecting means (6) carried on the carrier means (5) for engaging the interface means (2,3) for protecting the interface means (2,3) when the carrier means (5) is engaged in the receiving area.
2. A protective device as claimed in Claim 1 characterised in that the protecting means (6) is located on the carrier means (5) at a position which when the carrier means (5) is located in the receiving area coincides with an inoperative position of the interface means (2,3), and/or a position at which the interface means expects to find directory and/or other data on a data carrier.
3. A protective device as claimed in Claim 1 or 2 characterised in that the protecting means (6) engages the interface means (2,3) with a portion of the interface means (3,7) nested into the protecting means (6).
4. A protective device as claimed in Claim 3 characterised in that the area of the protecting means (6) offered up to the interface means (2,3) is at least of area similar to the area of the portion (3,7) of the interface means (2,3) to be nested into the protecting means (6).
5. A protective device as claimed in Claim 3 or 4 characterised in that the area of the protecting means (6) offered up to the interface means (2,3) is greater than the area of the portion (3,7) of the interface means (2,3) to be nested into the protecting means (6).
6. A protective device as claimed in any of Claims 3 to 5 characterised in that the area of the protecting means (6) offered up to the interface means (2,3) is such

that the protecting means (6) embraces a peripheral portion (7) extending around the portion (3) of the interface means (2,3) to be nested into the protecting means (6).

7. A protective device as claimed in any preceding claim characterised in that the protecting means (6) is resilient.

8. A protective device as claimed in any preceding claim characterised in that the protecting means (6) comprises a plurality of fibres (15) extending from the carrier means (5) for engaging the interface means (2,3).

9. A protective device as claimed in Claim 8 characterised in that the fibres (15) of the protecting means (6) are flexible.

10. A protective device as claimed in Claim 8 or 9 characterised in that the fibres (15) of the protective device (6) are resilient.

11. A protective device as claimed in any of Claims 8 to 10 characterised in that the fibres (15) of the protecting means (6) are provided in the form of a brush (6).

12. A protective device as claimed in any of Claims 8 to 11 characterised in that the fibres (15) of the protecting means (6) extend from a base member (14) mounted on the carrier means (5).

13. A protective device as claimed in Claim 12 characterised in that a resilient mounting means (21) is provided for resiliently mounting the base member (14) of the protecting means (6) to the carrier means (5).

14. A protective device as claimed in any preceding claim characterised in that the carrier means (5) defines a central axis (9) for in use coinciding with a rotational axis of a data carrier in the receiving area.

15. A protective device as claimed in any of Claims 8 to 14 characterised in that the carrier means (5) defines a carrier plane, and the fibres (15) of the protecting



means (6) extend from the carrier means (5) at an angle to the carrier plane of less than 90°.

16. A protective device as claimed in Claim 15 characterised in that the fibres (15) of the protecting means (6) extend from the carrier means (5) at an angle to the carrier plane in the range of 20° to 80°.

17. A protective device as claimed in Claim 16 characterised in that the fibres (15) of the protecting means (6) extend from the carrier means (5) at an angle to the carrier plane in the range of 50° to 80°.

18. A protective device as claimed in any of Claims 15 to 17 characterised in that the fibres (15) of the protecting means (6) extend from the carrier means (5) in a direction circumferentially relative to the central axis (9) defined by the carrier means (5).

19. A protective device as claimed in any of Claims 14 to 18 characterised in that the protecting means (6) extends circumferentially around the central axis (9) defined by the carrier means (5).

20. A protective device as claimed in Claim 19 characterised in that the protecting means (6) extends completely around the central axis (9) defined by the carrier means (5).

21. A protective device as claimed in any of Claims 14 to 20 characterised in that the protecting means (6) is spaced apart from the central axis (9) defined by the carrier means (5).

22. A protective device as claimed in any preceding claim characterised in that the protecting means (6) protects the interface means (2,3) from dirt and dust.

23. A protective device as claimed in any preceding claim characterised in that the protecting means (6) protects the interface means (2,3) from shock.

24. A protective device as claimed in any preceding claim characterised in that an indicating means (12) is provided for indicating the direction in which the carrier means (5) is to be inserted in the receiving area of the read and/or write unit.

25. A protective device as claimed in Claim 24 characterised in that the indicating means (12) is provided on the carrier means (5).

26. A protective device as claimed in Claim 24 or 25 characterised in that the indicating means (12) facilitates alignment of the protecting means (6) with the interface means (2,3).

27. A protective device as claimed in any preceding claim characterised in that the protecting means (6) is located on the carrier means (5) for cleaning the interface means (2,3) as the carrier means (5) is being inserted in the receiving area.

28. A protective device as claimed in any preceding claim characterised in that the protecting means (6) is located on the carrier means (5) for cleaning the interface means (2,3) when the read/write unit is activated for reading or writing data, and the interface means (2,3) is being initially moved for identifying data.

29. A protective device as claimed in any preceding claim characterised in that the carrier means (5) is provided for engaging in a disc receiving area of a disc drive read and/or write unit, and the protecting means (6) is provided for protecting a read and/or write head forming the interface means (2,3) of the read and/or write unit.

30. A protective device as claimed in Claim 29 characterised in that the protecting means (6) cleans the read and/or write head (2,3) of the disc drive read and/or write unit as the read and/or write head (2,3) is being initially moved for identifying data.

31. A protective device as claimed in Claim 30 characterised in that the protecting means (6) cleans the read and/or write head of the disc drive read and/or

write unit as the read and/or write head is being moved substantially perpendicularly relative to the carrier means (5) into and out of the protecting means (6).

32. A protective device as claimed in any of Claims 29 to 31 characterised in that the protecting means (6) is for protecting a read and/or write head provided by an optical head (2,3).

33. A protective device as claimed in Claim 32 characterised in that the protecting means (6) is for engaging a lens (3) of the read and/or write optical head (2).

34. A protective device as claimed in any of Claims 29 to 31 characterised in that the protecting means (6) is for protecting a read and/or write head provided by a magnetic head (2,3).

35. A method for protecting an interface means (2,3) of the type hereinbefore defined of a read and/or write unit of the type hereinbefore defined in which the read and/or write unit comprises a receiving area for receiving a data carrier, and the interface means (2,3) is located in or adjacent the receiving area, the method comprising the steps of inserting a carrier means (5) having a protecting means (6) mounted thereon into the receiving area of the read and/or write unit, and engaging the protecting means (6) with the interface means (2,3) when the carrier means (5) is engaged in the receiving area for protecting the interface means (2,3).

36. A method as claimed in Claim 35 characterised in that the protecting means (6) protects the interface means (2,3) from dirt and/or dust.

37. A method as claimed in Claim 35 or 36 characterised in that the protecting means (6) protects the interface means (2,3) from shock.

38. A method as claimed in any of Claims 35 to 37 characterised in that the protecting means (6) cleans the interface means (2,3) as the carrier means (5) is being inserted into the receiving area.

39. A method as claimed in any of Claims 35 to 38 characterised in that the protecting means (6) cleans the interface means (2,3) when the interface means (2,3) has been activated to identify data.

40. A method as claimed in any of Claims 35 to 39 characterised in that the protecting means (6) cleans the interface means (2,3) when the interface means (2,3) is being initially moved perpendicularly relative to the carrier means (5) into and out of the protecting means (6) for identifying data.

41. A method for protecting an interface means (2,3) of the type hereinbefore defined of a read and/or write unit of the type hereinbefore defined in which the read and/or write unit comprises a receiving area for receiving a data carrier, and an interface means (2,3) is located in or adjacent the receiving area, the method comprising the steps of inserting the carrier means (5) of the protective device (1,20,30) as claimed in any of Claims 1 to 34 into the receiving area of the read and/or write unit, and engaging the protecting means (6) with the interface means (2,3) when the carrier means (5) is inserted in the receiving area for protecting the interface means (2,3).

42. A method as claimed in Claim 41 characterised in that the read and/or write unit is a disc drive read and/or write unit, and the interface means (2,3) is a read and/or write head.

43. A method as claimed in Claim 42 characterised in that the read and/or write head (2,3) is an optical head (2).

44. A method as claimed in Claim 42 characterised in that the read and/or write head (2,3) is a magnetic head.

45. A method as claimed in any of Claims 41 to 44 characterised in that the method further comprises activating the read and/or write unit for causing the interface means (2,3) to cycle perpendicularly relative to a plane defined by the



## ABSTRACT

## "A protective device"

5 A protective device (1) for protecting an optical head (2) of a disc drive unit against dirt and dust and shock when the disc drive unit is not in use comprises a carrier disc (5) similar to a music CD disc for engaging in the disc receiving area of the disc drive unit. A brush member (6) located on the carrier disc (5) at a position corresponding to the inner data track (10) of a music CD disc is provided for engaging a lens (3) and a peripheral portion (7) of a lens carrier (4) of the head (2) when the head (2) is  
10 in the inactive position for protecting the lens (3) and the peripheral portion (7) against dirt and dust. Fibres (15) of the brush member (6) are of sufficient length to engage and embrace the lens (3) and the peripheral portion (7) of the lens carrier (4) when the head (2) is in the inactive position. The fibres (15) are of sufficient resilience for also protecting the head (2) against shock. The brush member (6) also  
15 cleans the lens (3) as the brush member (6) passes by the lens (3) on insertion and ejection of the carrier disc (5) in and from the disc receiving area. Further cleaning can be achieved by activating the disc drive unit for causing the head (2) to go through a number of data focusing cycles for urging the lens (3) into and out of the brush member (6).

20

Figs. 1 and 3 to accompany the abstract.

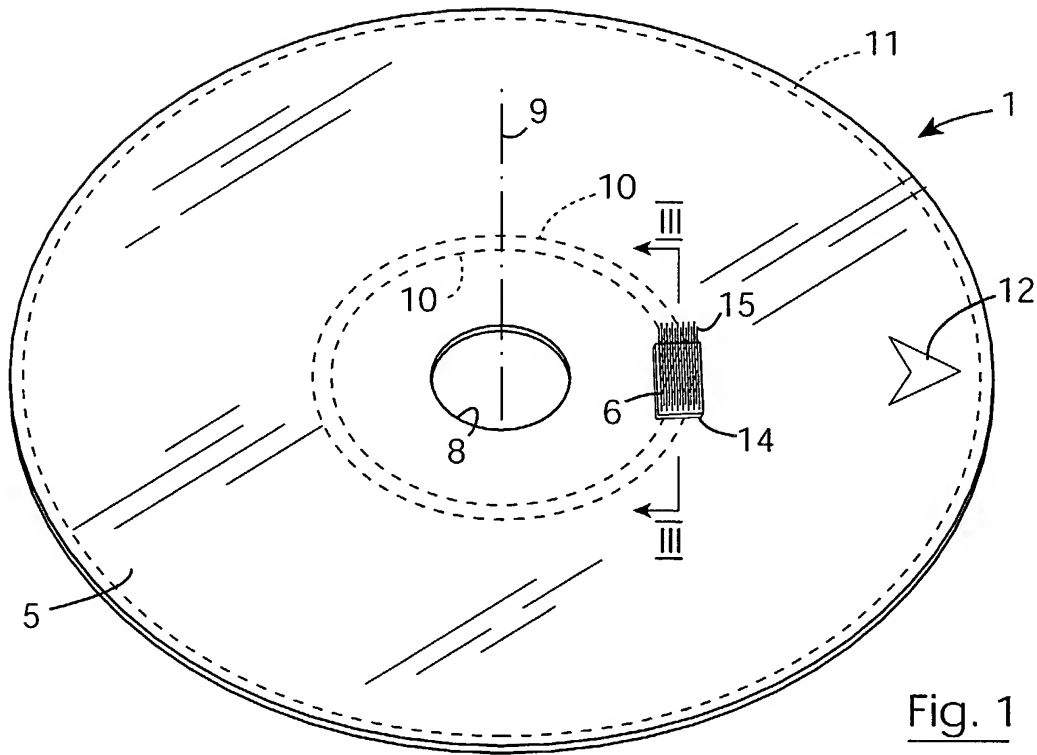


Fig. 1

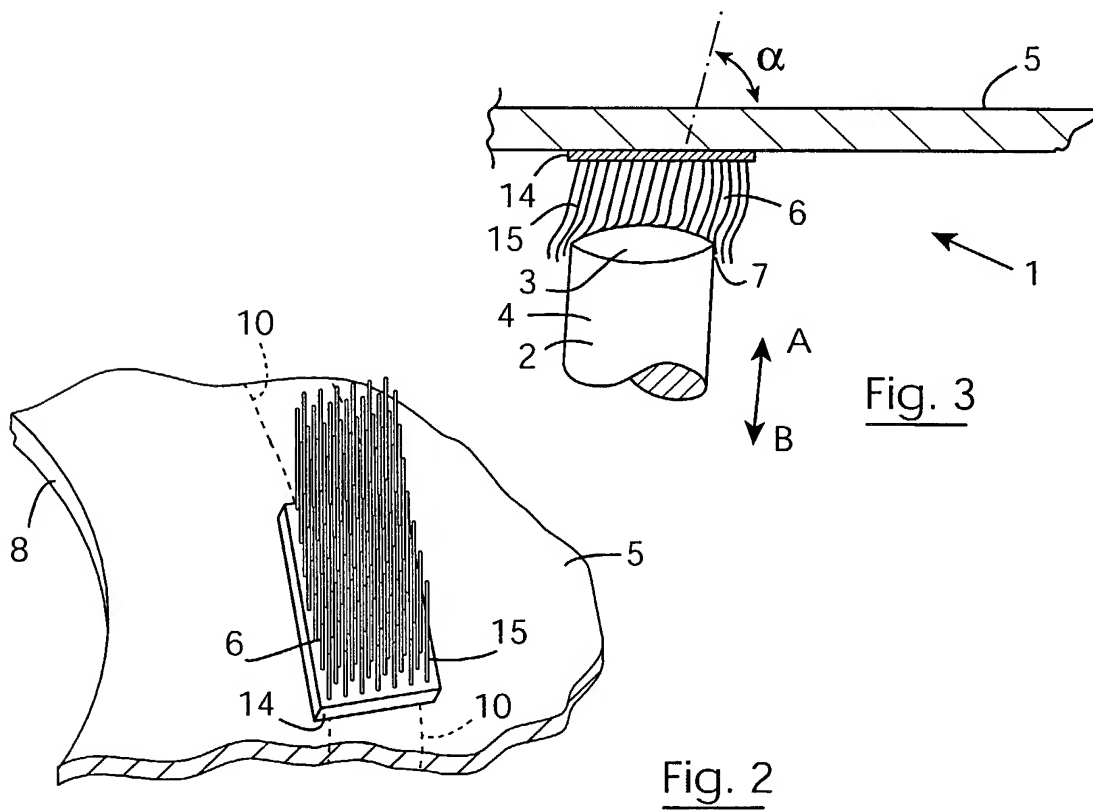
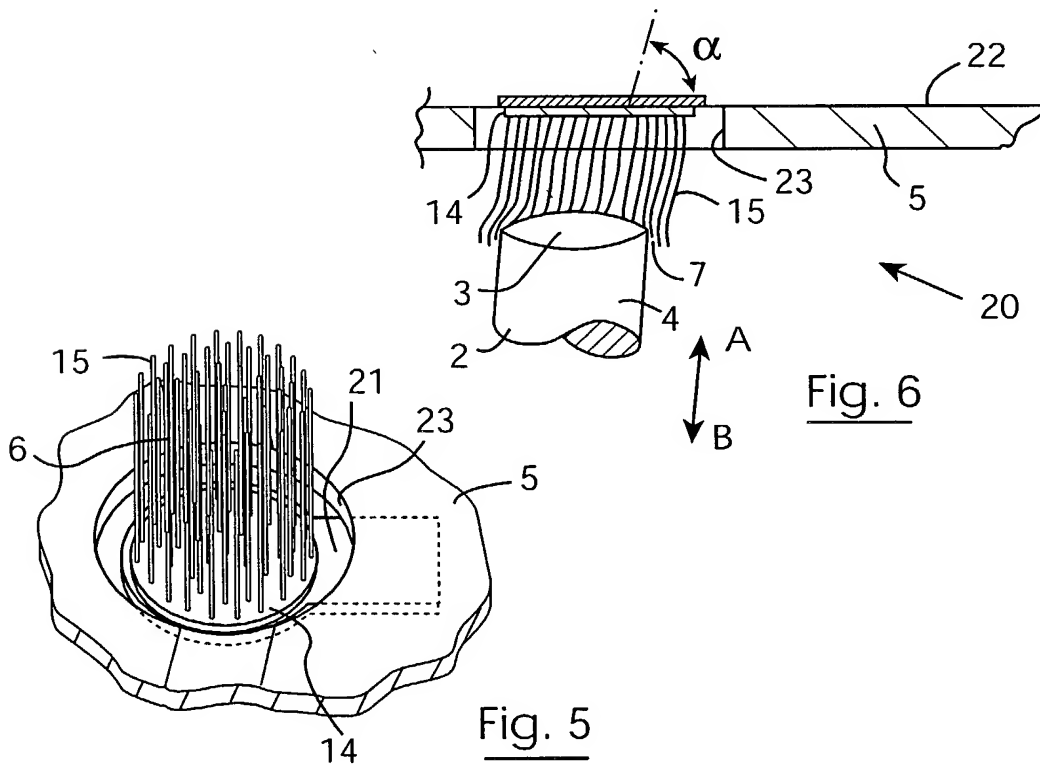
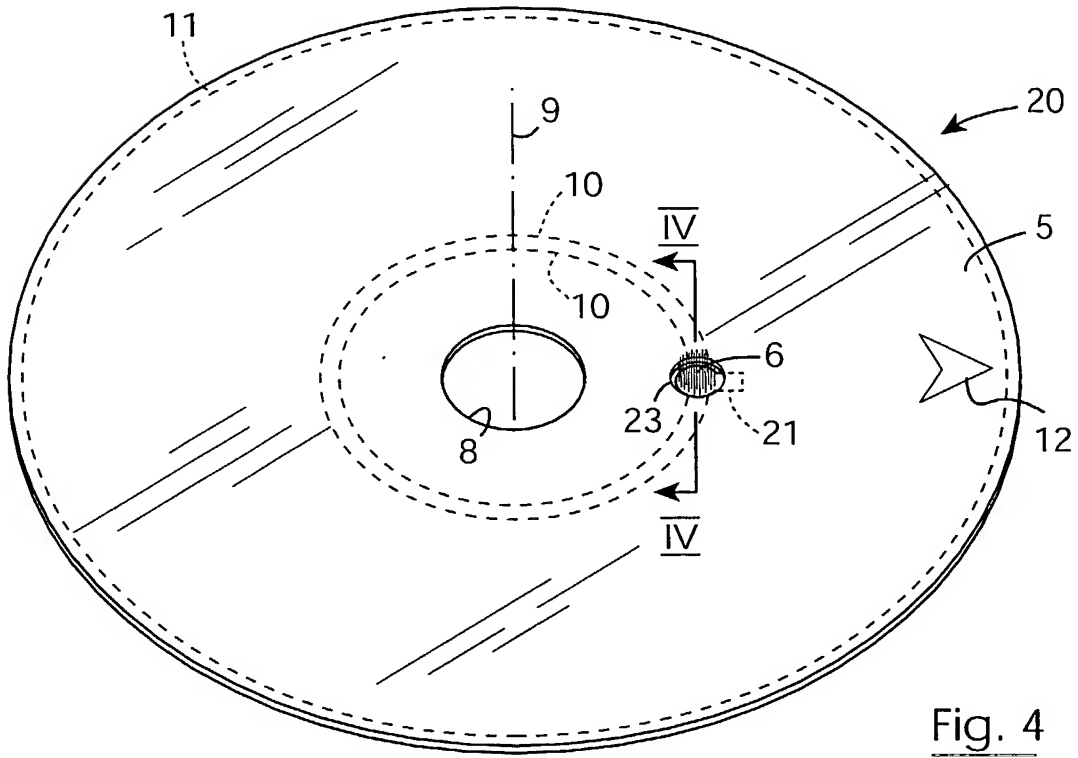


Fig. 2

2 / 3





3 / 3

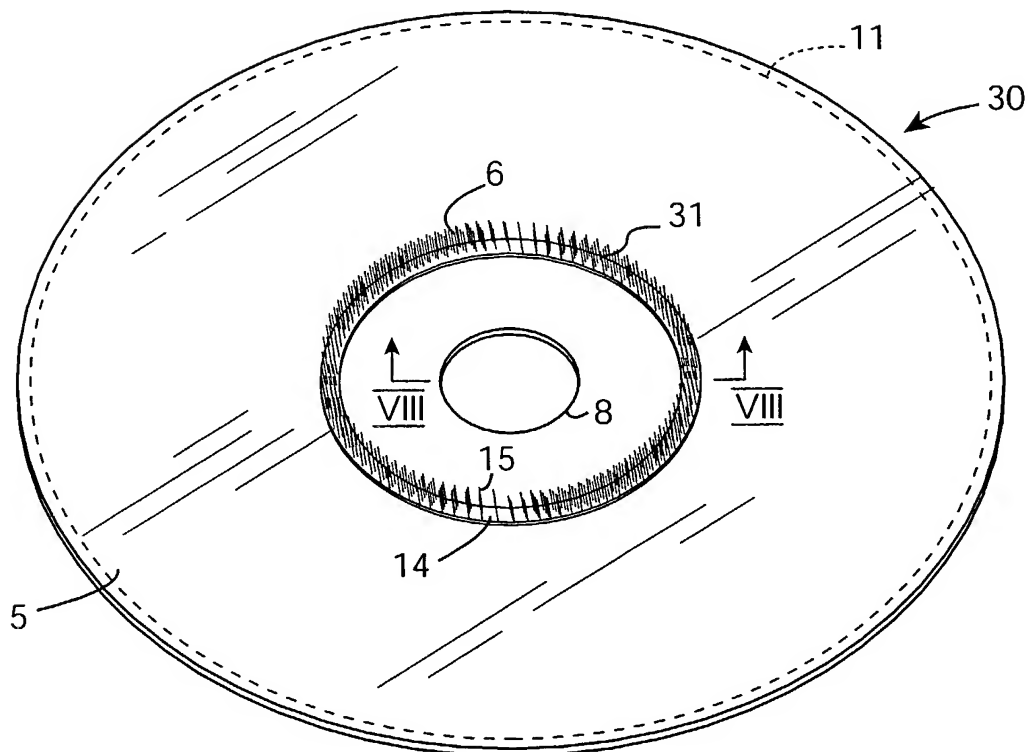


Fig. 7

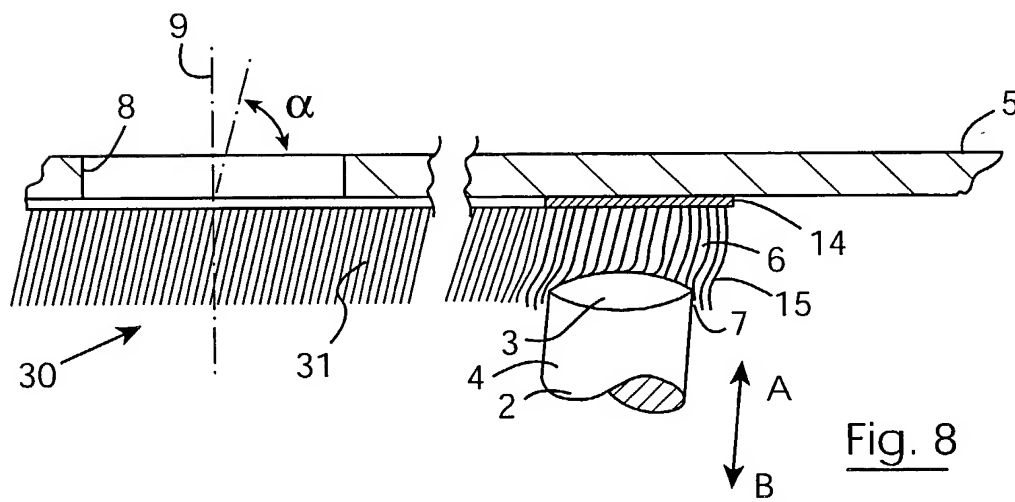


Fig. 8

1-00  
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Mailing Address:

City	State	Zip	Country
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**DECLARATION AND POWER OF ATTORNEY FOR UTILITY OR DESIGN PATENT APPLICATION (37 CFR 1.63)**

As a below named inventor, I hereby declare that: My residence, mailing address, and citizenship are as stated below next to my name. I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled:

"A protective device"

the application of which

☐ is attached hereto

OR

☒ was filed on July 5, 2000 ~~as United States Application~~  
~~Number~~ on PCT International Application Number PCT/IE 00/00084  
 (Confirmation No. \_\_\_\_\_), and was amended on \_\_\_\_\_  
 (if applicable).

I hereby state that I have reviewed and understand the contents of the above identified application, including the claims, as amended by any amendment specifically referred to above.

I acknowledge the duty to disclose information which is material to patentability as defined in 37 CFR 1.56, including for continuation-in-part application(s), material information which became available between the filing date of the prior application and the national or PCT international filing date of the continuation-in-part application.

I hereby claim foreign priority benefits under 35 U.S.C. 119(a)-(d) or (f), or 365(b) of any foreign application(s) for patent, inventor's or plant breeder's rights certificate(s), or 365(a) of any PCT international application(s) which designated at least one country other than the United States of America, listed below and have also identified below, by checking the box, any foreign application(s) for patent, inventor's or plant breeder's rights certificate(s), or any PCT international application(s) having a filing date before that of the application on which priority is claimed.

Prior Foreign Application Number(s)	Country	Foreign Filing Date	Priority Claimed	
			Yes	No
S99 0560	Ireland	July 6, 1999	<input checked="" type="checkbox"/>	<input type="checkbox"/>
S99 0561	Ireland	July 6, 1999	<input checked="" type="checkbox"/>	<input type="checkbox"/>

I hereby claim domestic priority benefits under 35 United States Code §120 of any United States application(s), §119(e) of any United States provisional application(s), or §365(c) of any PCT International application(s) designating the United States, listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in a listed prior United States or PCT International application in the manner provided by the first paragraph of Title 35, United States Code, §112, I acknowledge my duty to disclose any information material to the patentability of this application as defined in 37 C.F.R. 1.56 which occurred between the filing date of the prior application and the national or PCT international filing date of this application:

Prior U.S. or International Application Number(s)	U.S. or International Filing Date	Status

I hereby appoint all attorneys of **SUGHRUE MION, PLLC** who are listed under the USPTO Customer Number shown below as my attorneys to prosecute this application and to transact all business in the United States Patent and Trademark Office connected therewith, recognizing that the specific attorneys listed under that Customer Number may be changed from time to time at the sole discretion of Sughrue Mion, PLLC, and request that all correspondence about the application be addressed to the address filed under the same USPTO Customer Number.



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PATENT TRADEMARK OFFICE

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under 18 U.S.C. 1001 and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.